

EXPERIMENT NO. 4
SPECIFIC GRAVITY AND ABSORPTION
OF COARSE AGGREGATES



GROUP NO.4

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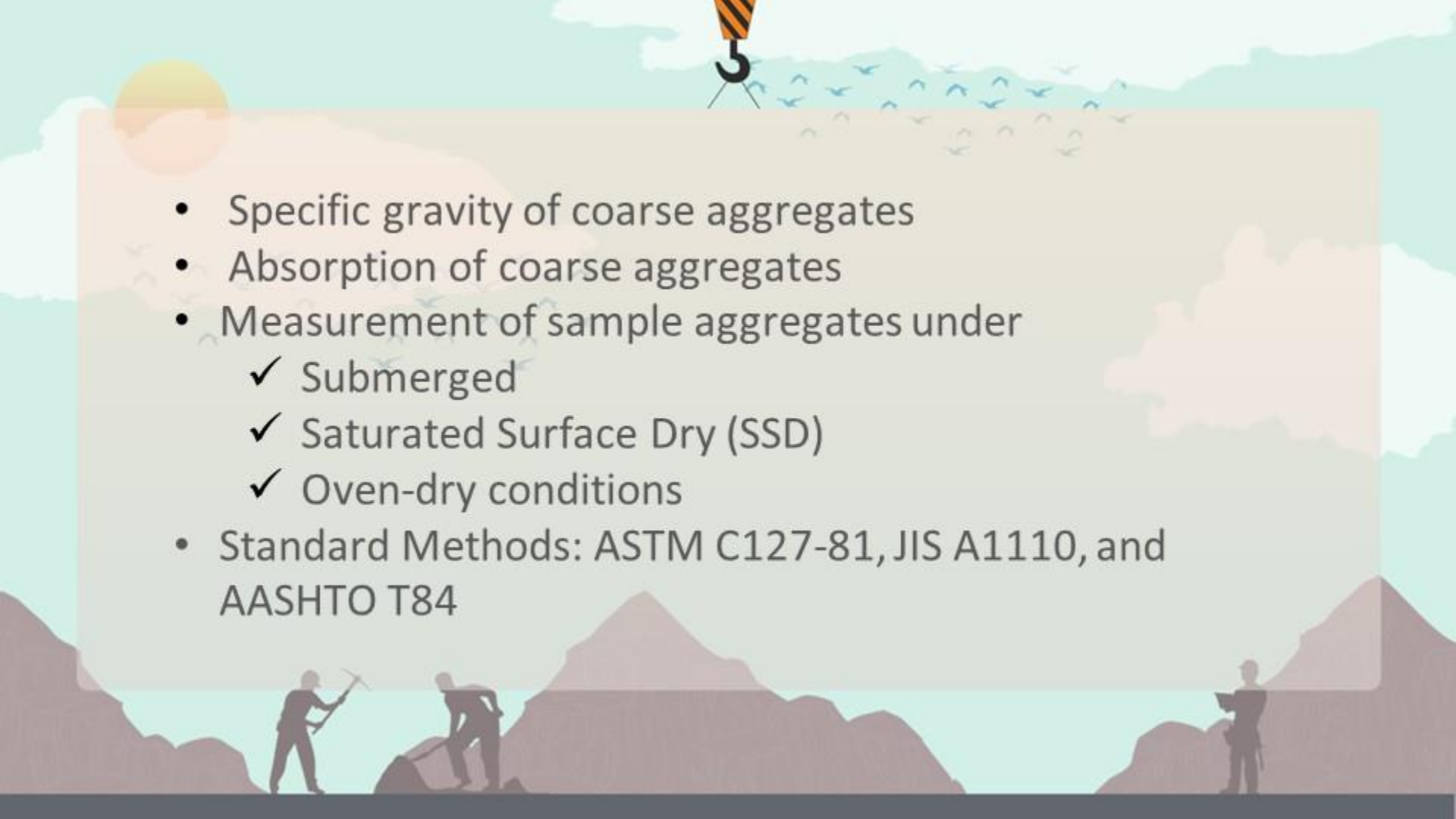
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The background is a stylized illustration. The top half features a light yellow sky filled with numerous small, dark green birds in flight. A dark green, abstract shape resembling a bird or a plant hangs from the top center. The bottom half shows a dark green city skyline with various building shapes. A dark green rectangular box is centered in the middle of the image, containing the word 'INTRODUCTION' in a pink, outlined, sans-serif font. A thin pink horizontal line is positioned below the text.

INTRODUCTION

- 
- Specific gravity of coarse aggregates
 - Absorption of coarse aggregates
 - Measurement of sample aggregates under
 - ✓ Submerged
 - ✓ Saturated Surface Dry (SSD)
 - ✓ Oven-dry conditions
 - Standard Methods: ASTM C127-81, JIS A1110, and AASHTO T84



PROCEDURES

1

For a period of 24 ± 4 hours, the sample of the selected aggregates were soaked in water.

 24



2

The undesired aggregate was removed using the 5-mm sieve. The retained aggregate was used as the test sample.

3

The test samples were covered in a large absorbent cloth and wiped until no visible films of water are seen to attain saturated surface-dry (SSD) condition.





4

A pan capable of being heated at 110 ± 5 °C for 24 hrs was selected. The *weight of the selected pan* and the *weight of the SSD aggregates and pan* were measured using a digital weighing scale.

5

The apparatus for specific gravity was assembled and the water container was filled to its capacity.

6

The weight of the wire basket was measured while submerged in water. To take the weight of the test sample in water, the aggregate was placed in the wire basket and submerged in the water.

7

After removing the aggregate from the wire basket, it was oven-dried at 110 ± 5 °C for 24 hrs and was cooled at room temperature to determine the aggregates' absorption.

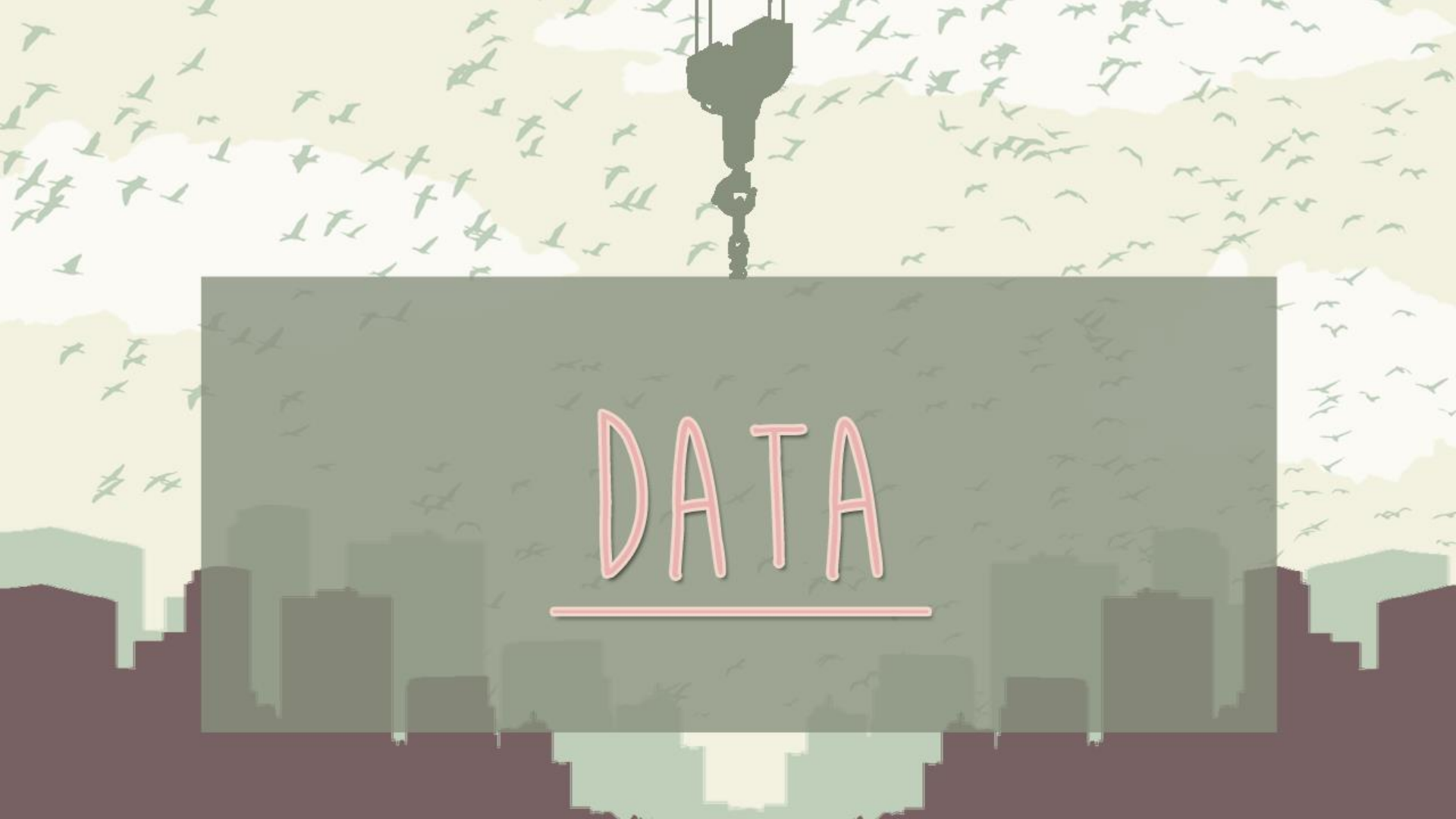
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The weight of both the oven-dried aggregate and pan were measured.

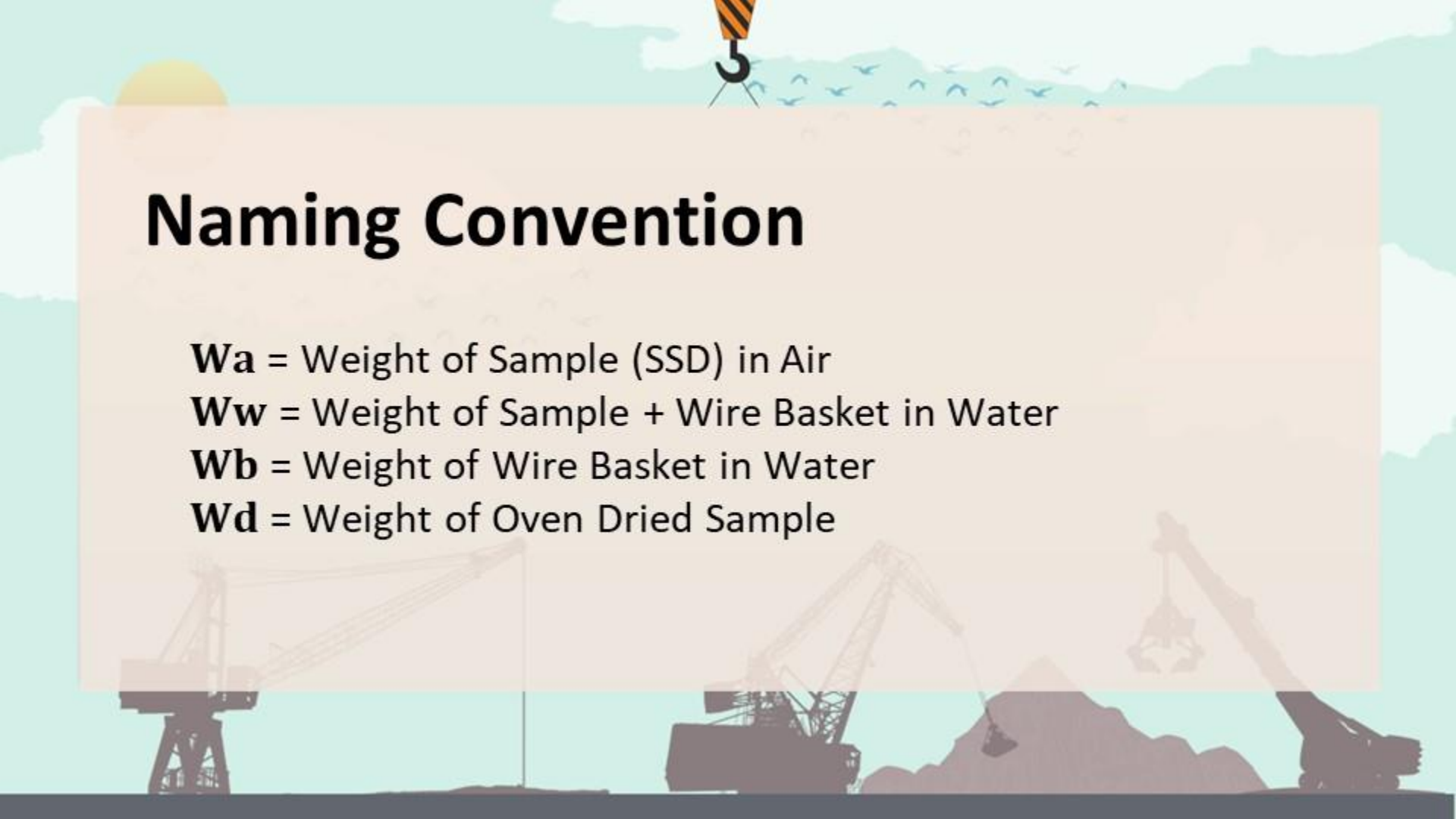
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The process is repeated two more times to get an average result for both specific gravity and absorption of the aggregates.





DATA



Naming Convention

W_a = Weight of Sample (SSD) in Air

W_w = Weight of Sample + Wire Basket in Water

W_b = Weight of Wire Basket in Water

W_d = Weight of Oven Dried Sample

Formulas

Weight of Sample (SSD) in Air, W_a

$$W_a = (\text{Weight of Sample (SSD)} \\ + \text{Pan in Air}) - \text{Weight} \\ \text{of Pan}$$

Weight of Sample in Water, W_s

$$W_s = W_w - W_b$$

Weight of Oven-Dried Sample, W_d

$$W_d = (\text{Weight of Oven Dried} \\ \text{Sample} + \text{Pan}) - \\ \text{Weight of Pan}$$

Specific Gravity, SG

$$SG = \frac{W_a}{(W_a - W_w + W_b)}$$

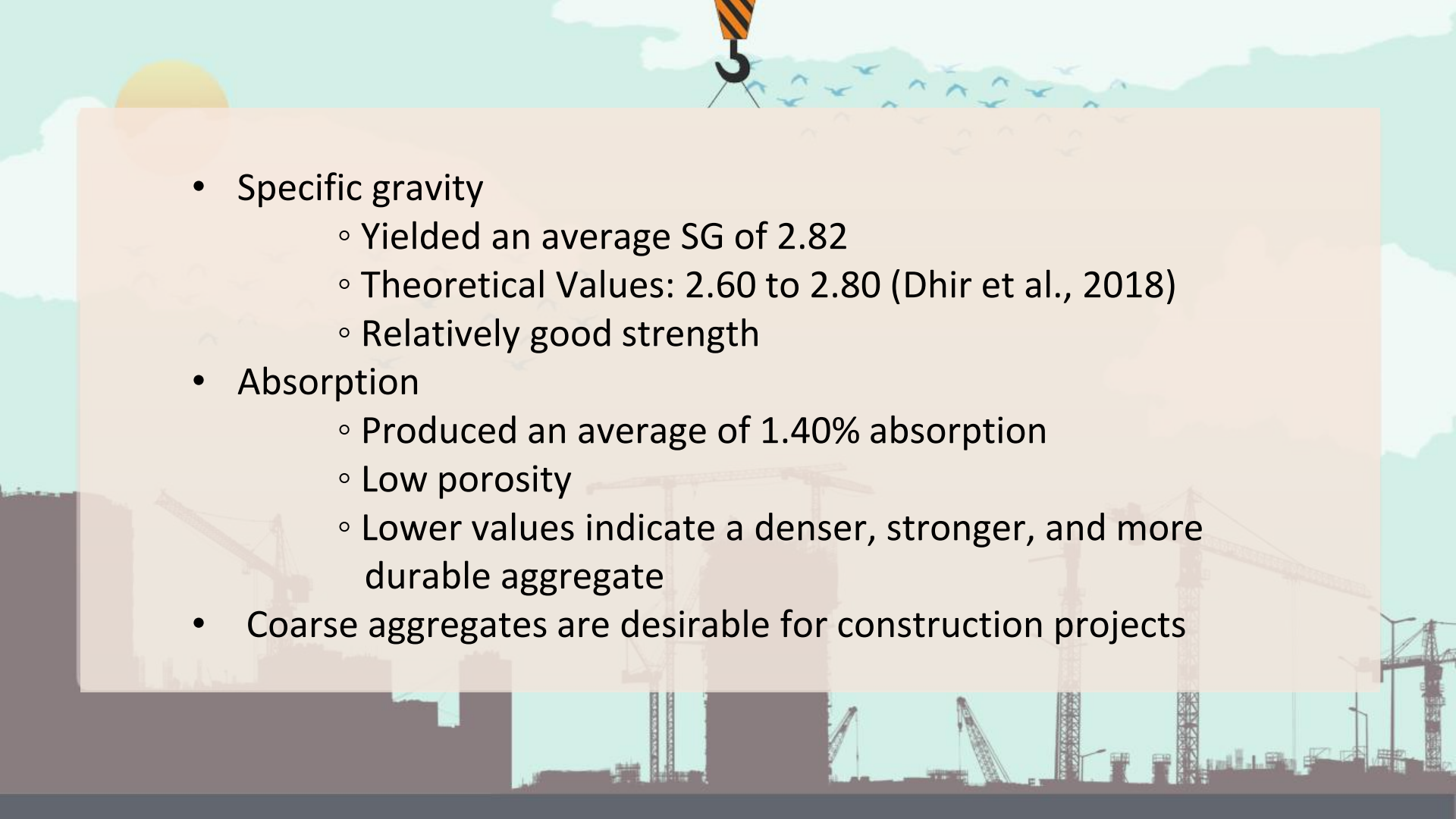
Absorption, $A\%$

$$A\% = 100 \times \frac{(W_a - W_d)}{W_d}$$

Test No		1	2	3
1	Pan No.	1	2	3
2	Weight of Pan, g	389.10	346.50	348.00
3	Weight of Sample (SSD) + Pan in Air, W_a , g	4124.00	3634.50	3881.10
4	Weight of Sample (SSD) in Air, g	3734.90	3288.00	3533.10
5	Weight of Wire Basket, g	1265.90	1267.50	1237.80
6	Weight of Sample + Wire Basket in Water, g	3685.60	3387.80	3516.60
7	Weight of Sample in Water, W_s , g	2419.70	2120.30	2278.80
8	Specific Gravity, GS	2.84	2.82	2.82
9	Average Specific Gravity (SSD)	2.82		
10	Weight of Oven Dried Sample + Pan, g	4077.00	3588.50	3828.40
11	Weight of Oven Dried Sample, W_d , g	3687.90	3242.00	3480.40
12	Absorption, A%	1.27	1.42	1.51
13	Average Absorption, %	1.40		

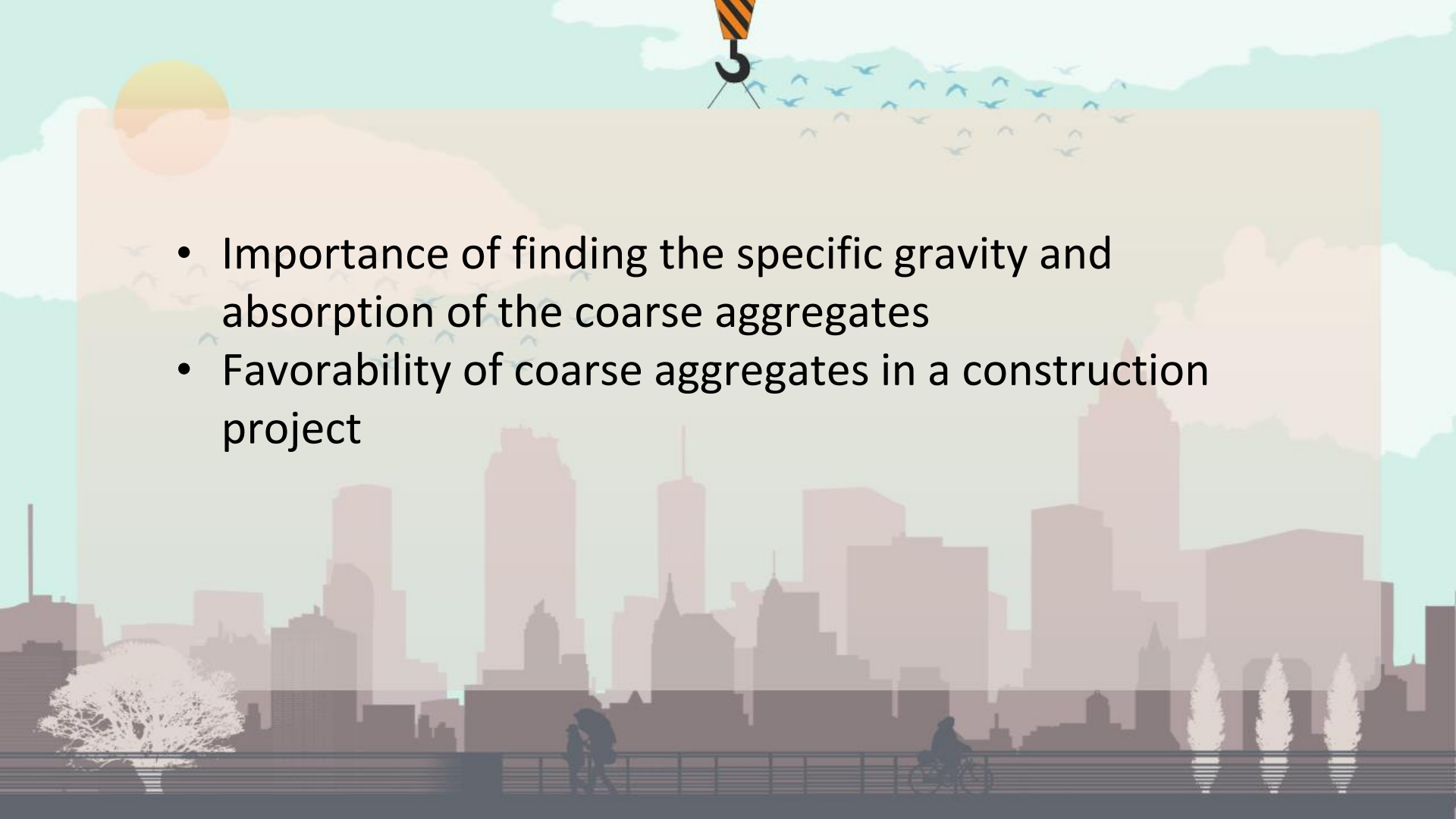


CONCLUSION

- 
- Specific gravity
 - Yielded an average SG of 2.82
 - Theoretical Values: 2.60 to 2.80 (Dhir et al., 2018)
 - Relatively good strength
 - Absorption
 - Produced an average of 1.40% absorption
 - Low porosity
 - Lower values indicate a denser, stronger, and more durable aggregate
 - Coarse aggregates are desirable for construction projects



THINGS LEARNED --- FROM THE EXPERIMENT

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- A stylized background illustration. At the top center, a crane hook with orange and black stripes hangs down. To the left, a large yellow sun is partially obscured by a light orange cloud. Numerous small blue birds are flying across the sky. The middle ground features a city skyline with various buildings in shades of pink, purple, and grey. In the foreground, there are silhouettes of a person walking with a backpack, a person on a bicycle, and some trees. The overall color palette is soft and pastel.
- Importance of finding the specific gravity and absorption of the coarse aggregates
 - Favorability of coarse aggregates in a construction project



REFERENCES



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